Abstract

A method and apparatus for directing energy in a plurality of azimuth directions. The amount of energy directed in the azimuth direction of a mobile terminal is a function of the location and acceptable receive strength of at least two mobile terminals. The function is such that the strength of an EM field at the location of any of these two mobile terminals is at least as large as, but not significantly larger than, needed for that mobile terminal to acceptably receive the signal carried by the EM field. The amount of energy to be directed in the azimuth direction of a mobile terminal is arrived at by first determining for each one of the mobile terminals an EM field that would have to be generated for the mobile terminal in order to provide an acceptable receive strength thereat, the determining taking into account the strength, at the location of the mobile terminal, of EM fields previously determined for others of the mobile terminals. This determining is repeated until the EM fields determined for at least two of the mobile terminals provide an EM field strength for each of these two mobile terminals that is substantially equal to its adequate receive strength. This determining is repeated until the EM fields converge. The amount of energy is then determined based on the EM fields thus determined. After the EM fields converge, the composite EM field that has thus been arrived at is the aforementioned composite EM field whose strength at the location of any of the at least two mobile terminals is at least as large as, but not significantly larger than, needed for that mobile terminal to acceptably receive the signal. This saves system resources, reduces interference with other signals, and increases the number of signals that can be transmitted simultaneously, which results in an increase in capacity, and therefore in profitability of the wireless communication system.